

CLAIMS

1. An electronic brush (10) for dispensing ink (22) onto a writable medium (30), the electronic brush comprising:
 - an electronic-brush housing (12);
 - at least one ink dispenser (20) coupled to the electronic-brush housing;
 - an electronic-brush scanner (14) coupled to the electronic-brush housing; and
 - a controller (16) in electrical communication with the ink dispenser and the electronic-brush scanner,wherein a position of the electronic brush is determined based on at least one position indicator in a first portion of a dispensed image that is scanned by the electronic-brush scanner and communicated to the controller, and
wherein an ink-dispense signal is sent from the controller to the ink dispenser based on the determined electronic-brush position.
2. The electronic brush of claim 1, wherein the writable medium is selected from the group consisting of a whiteboard, a wall, a poster, a billboard, a fabric, a notebook, a sheet of paper, a piece of cardboard, a non-paper material, and a writable surface.
3. The electronic brush of claim 1, wherein the ink dispenser is selected from the group consisting of an inkjet cartridge, a solid-ink printhead, a dry-ink printhead, a dot matrix printhead, an actuatable felt-tip pen, a non-contact ink dispenser, an ink ejection nozzle, a glue dispenser, and a liquid dispenser.
4. The electronic brush of claim 1, wherein the electronic-brush scanner includes one of an optical scanner and at least one imaging array.
5. The electronic brush of claim 1, wherein the controller is wired to or wirelessly connected to the ink dispenser and the electronic-brush scanner.
6. The electronic brush of claim 1, further comprising:
 - at least one position detector (50) coupled to the electronic brush for determining an initial position of the electronic brush.

7. The electronic brush of claim 6, wherein the position detector is selected from the group consisting of a wheel position detector, a trackball, an optical mouse, an ultrasonic transducer attached to the electronic brush, an ultrasonic transducer attached to the writable medium, a tilt sensor, and a global positioning system unit.

8. A method of dispensing ink (22) on a writable medium (30), the method comprising:
scanning a first position indicator in a first portion of a dispensed image on the writable medium;
determining a position of an electronic brush (10) based on the scanned position indicator;
modifying image data to embed a second position indicator in a second portion of the image based on the determined position of the electronic brush; and
dispensing the second portion of the image including the second position indicator onto the writable medium.

9. The method of claim 8, wherein determining the position of the electronic brush includes:
comparing the scanned position indicator to unmodified image data; and
determining the position of the electronic brush based on the comparison.

10. The method of claim 8, wherein determining the position of the electronic brush includes:
determining a writable-medium coordinate based on the scanned position indicator; and
determining the position of the electronic brush based on the writable-medium coordinate.

11. The method of claim 8, wherein determining the position of the electronic brush includes:
scanning a plurality of first position indicators in the first portion of the dispensed image; and determining the location and rotation of the electronic brush based on the scanned position indicators.

12. The method of claim 8, wherein modifying the image data to embed the second position indicator in the second portion of the image includes:

manipulating at least one image pixel in the second portion of the image.

13. The method of claim 12, wherein manipulating at least one image pixel includes: setting or clearing the at least one image pixel.

14. The method of claim 12, wherein manipulating at least one image pixel includes: adjusting the at least one image pixel.

15. The method of claim 8, wherein the second portion of the image is dispensed using at least one ink dispenser (20) coupled to the electronic brush.

16. The method of claim 15, wherein the ink dispenser is selected from the group consisting of an inkjet cartridge, a solid-ink printhead, a dry-ink printhead, a dot matrix printhead, an actuatable felt-tip pen, a non-contact ink dispenser, an ink ejection nozzle, a glue dispenser, and a liquid dispenser.

17. The method of claim 8, further comprising:
receiving an electronic-brush position signal; and
determining an initial position of the electronic brush based on the received position signal.

18. The method of claim 17, wherein receiving the position signal is selected from the group consisting of: receiving a wheel position signal from one or more wheels coupled to the electronic brush; receiving a trackball position signal from one or more trackballs attached to the electronic brush; receiving an optical mouse position signal from one or more optical mice attached to the electronic brush; receiving an ultrasonic signal from one or more ultrasonic transducers attached to the electronic brush; receiving an ultrasonic signal from one or more ultrasonic transducers attached to the writable medium; receiving a tilt signal from a tilt sensor attached to the electronic brush; and receiving a global positioning system signal from a global positioning system unit attached to the electronic brush.

19. The method of claim 8, further comprising:
dispensing the first portion of the image onto the first portion of the writable medium,
wherein the first portion of the image includes the first position indicator.
20. A system for dispensing ink (22) on a writable medium (30), the system comprising:
means for scanning a first position indicator in a first portion of a dispensed image on
the writable medium;
means for determining a position of an electronic brush (10) based on the scanned
position indicator;
means for modifying image data to embed a second position indicator in a second
portion of the image based on the determined position of the electronic brush; and
means for dispensing the second portion of the image including the second position
indicator onto the writable medium.
21. The system of claim 20, further comprising:
means for receiving an electronic-brush position signal; and
means for determining an initial position of the electronic brush based on the received
position signal.
22. The system of claim 20, further comprising:
means for dispensing the first portion of the image onto the first portion of the writable
medium, wherein the first portion of the image includes the first position indicator.